To: API Lubricants Group  
Cc: Lubricants Group Mailing List  
API

**Ballot to Establish Sequence VIF BOI**

At the September 12, 2018 Lubricants Standards Group (LSG) Meeting BOI/VGRA Proposal 2 to establish Sequence VIF BOI. BOI/VGRA Proposal 2 establishes Table E-xx Seq. VIF - Tests Required for Interchanging the Base Stock.

After review and discussion, there was a Motion to accept Table E-xx Seq. VIF - Tests Required for Interchanging the Base Stock.

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Motion:
- Motion to Ballot the proposed changes contained in BOI/VGRA Proposal 2
- Changes are shown in the attached BOI/VGRA Proposal 2.
  - Motion by LSG Chair, Josh Frederick
  - Second by Michael Alessi
    - Approve=16
    - Negative=0
    - Abstain=0
```

Attachment 1 is a copy of the BOI VGRA Task Force Proposal 2 with the LSG Meeting Motion attached at the end.

After review and discussion, the LSG agreed by voice vote to Ballot Table E-xx Seq. VIF - Tests Required for Interchanging the Base Stock.

Attachment 2 illustrates the Table E-xx Seq. VIF - Tests Required for Interchanging the Base Stock. LSG Members and Interested Parties are asked to review the Seq. VIF BOI and Vote or Comment on accepting it into API 1509.

Lubricants Group Members should use the API eBallot System to cast their vote and make comments. The eBallot Link is: [http://Ballots.api.org](http://Ballots.api.org). The Lubricants Group Member votes will be counted, and all received comments reviewed and considered before the ballot results are final.

Non-Lubricants Group Members should comment on the Ballot Motion using the eBallot system. The eBallot Link is: [http://Ballots.api.org](http://Ballots.api.org). All comments on the Ballot Motion will be reviewed before the ballot results are final.

This eBallot will close on November 5, 2018. All Votes and/or Comments must be received by the close date.
Attachment 1
API Lubricants Group
BOI VGRA Task Force Proposal 2

Sequence VI F BOI

R. C. Dougherty
September 12, 2018
The following to be added to Annex E:

**Table E-xx  Seq. VIF - Tests Required for Interchanging the Base Stock**

<table>
<thead>
<tr>
<th>Base Stock in Original Test Oil</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
<th>Group V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group II</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group III</td>
<td>Required</td>
<td>Required</td>
<td>Not Required if the Base Oil VI of Candidate Oil ≥ Original Test Oil</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group IV</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group V</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>
Background Information
Executive Summary

For the Sequence VIF BOI Matrix analysis, we considered two different approaches for measuring the effect of base oil quality on FEI, by quantifying it by:

1. **Slate** (categorical variable with levels for Slates D, E, and I)
2. **BOVI** (continuous variable)

1. **Model with Technology and Slate**
   - Technology is statistically significant for FEI1 and FEISUM but not for FEI2
   - BS Slate is borderline significant ($p=0.109$) for FEISUM, but not statistically significant for FEI1 or FEI2.

2. **Model with Technology and Base Oil Viscosity Index (BOVI)**
   - Technology is statistically significant for FEI1 and FEISUM but not for FEI2
   - BOVI is significant ($p=0.043$) for FEISUM, but not statistically significant for FEI1 or FEI2.
Motion

• Motion to Ballot the proposed changes contained in BOI/VGRA Proposal 2
Attachment 2
Sequence VIF BOI

Table E-xx  Seq. VIF - Tests Required for Interchanging the Base Stock
Sequence VIF BOI Recommendation

The following to be added to Annex E:

**Table E-xx  Seq. VIF - Tests Required for Interchanging the Base Stock**

<table>
<thead>
<tr>
<th>Base Stock in Original Test Oil</th>
<th>Interchange Base Stock</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
<th>Group V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group II</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group III</td>
<td>Required</td>
<td>Required</td>
<td>Not Required if the Base Oil VI of Candidate Oil ≥ Original Test Oil</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Group IV</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Not Required provided the interchange Group IV meets the original manufacturer’s specifications in all physical and chemical properties</td>
<td>Required</td>
</tr>
<tr>
<td>Group V</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>